OUR REF: AN-C33/1

Greenbank Electronics

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KEYBOARD PORT AND VDU PAGE DECODER FOR 'ISBUS' SYSTEMS (DCR-6 MODIFICATIONS)

(Of particular interest to ZYMON 1 and Tiny BASIC V5.01 Users).

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Keyboard Port and VDU 'Page' Decoder for 'ISBUS' Systems

Introduction

This note discusses some of the considerations which must be taken into account when using software which uses both 'I/O' and 'Memory' spaces.

The two latest pieces of firmware we have are 'ZYMON 1' and Tiny BASIC V5.01,2 etc. These have been designed in accordance with the guidelines laid down in our Note Ref. AN-C23 - Memory Maps. In particular, the chosen location for the ASCII Keyboard is I/O Port number 40 (hexadecimal), and a memory-mapped VDU is located in the Memory Space, starting at C000.

A new keyboard card 'KBP-1' has been designed to satisfy these requirements, but has not yet reached the manufacturing stage. It is however a fairly easy circuit to construct on a spare 'Breadboard' card and the circuit can be made available at nominal charge to anyone who is interested (Ask for our note ref. AN-C32 - 'Keyboard Interface').

The card which most nearly carries out this function is available in the 'Kemitron' range as the 'DCR-6' card. No doubt many existing users will be familiar with it, and will prefer to retain it, with some modifications, when they upgrade to say ZYMON 1 or Tiny BASIC V5.01,2 etc., or any new programs written to the specifications laid down in our note on Memory Maps (ie. AN-C23)

In summary, the best way to interface the ASCII keyboard is to use the newest circuit (see our Ref AN-C32), but the Kemitron DCR-6 can certainly be used, and the remainder of this note explains how.

General Remarks

The circuit diagrams and description of the DCR-6 card in its original form are provided with the DCR-6 card itself, and the circuit diagram in its modified form is to be found at the end of this leaflet. The main source of reference when carrying out the modifications will be the circuit diagram, but one or two (hopefully helpful) remarks on the subject are set out below.

VDU Page Select

Really this has nothing to do with the ASCII Keyboard at all, and it is part of the Kemitron VDU A-B-G 3-card VDU address decoding. (Originally the various 'page select' outputs were used extensively as alternative means of providing address decoding in the system. The method has now gone out of fashion, as all cards are normally fully decoded on the cards themselves. The Kemitron VDU A-B-G set is the only part of the system which actively needs to have a page select signal).

In short, the VDU Page Select is a necessary hangover from a bygone age, and will only be needed if the Kemitron VDU A, B, G cards are in use.

The page chosen for the VDU is page 'C' (i.e. addresses beginning C000) and the NMREQ signal must be included. The standard DCR-6 meets neither of these requirements and two methods of modification are shown at the right hand side of our circuit diagram.

Method ① is perhaps the most straight-forward, and the single 74LS139 can be mounted on one of the 'patch' areas provided. The 7442 or 74LS42 used previously on the DCR-6 is not now required and the vacant holes where its socket was fitted make handy points to pick up the AB12, 13, 14, 15 signals for the new 74LS139.

An alternative method, 'Method ②', is shown on the circuit diagram. This is included so that an existing DCR-6 user is not obliged to discard his 7442/74LS42. Method ② will probably be preferred by users upgrading from the original Tiny BASIC (Version V1.1, .2 etc.), because they will have already made the majority of the modification using the chips and pin numbers shown in Method ②.

Keyboard I/O Port.

This is shown at the left-hand side of the circuit diagram. To decode the port completely nine inputs have to be accommodated (ie the lower eight address lines for the port address, and the N I/O REQ signal itself). The DM 8131 device already present on the DCR-6 board can be used for six of these signals, and the remaining three can be accommodated by the addition of a single 74LS32 mounted on a patch area. The six selection links S1-S6 provide a certain amount of flexibility ~~over~~ in the choice of Keyboard Port Addresses, but as the most common requirement will be for Port Number 40 (hex.) the connections of the S1-S6 links to achieve this have been shown. In binary 40 translates to 0100 0000 (4 and 0), thus most of the links go to 0V (logic '0'), only one going to +5V (logic '1').

The rest of the circuitry (ie. the 4528 monostable, and the octal data bus buffer) remains substantially the same, and the original (unmodified) DCR-6 description will apply unaltered. Users who already have existing software such as Tiny BASIC V1.1 or V1.2 will therefore be able to leave the connections to the ASCII keyboard and the Links L1 and L2 undisturbed.

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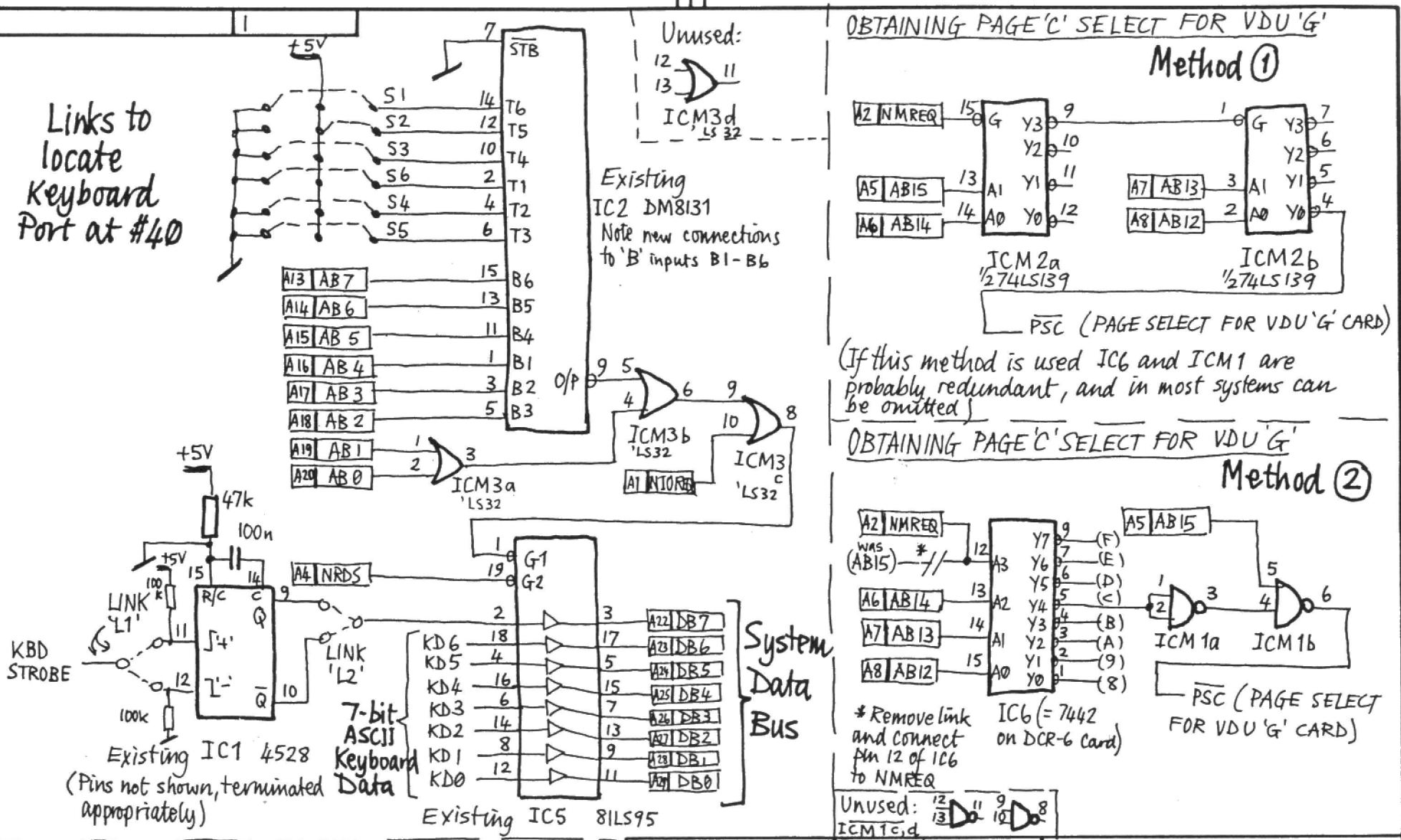

FOR Z80 USE (I.E. THESE DIAGRAMS), THE DCR-6 BOARD WILL HAVE THE FOLLOWING OF ITS ORIGINAL IC'S FITTED: IC1 - FITTED, IC2 - FITTED (wiring modified), IC3 - OMITTED, IC4 - OMITTED, IC5 - FITTED, IC6 - MAYBE (Used for 'Method 2')

Power Supplies + IC Types		+5V	0V
ICM1	74LS00	14	7
ICM2	74LS139	16	8
ICM3	74LS32	14	7

Drawn	D.M.P
Date	29-6-81
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CIRCUIT DIAGRAM OF DCR-6 CARD AFTER MODIFICATION

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